

## Claims

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1 A method of configuring a tape storage medium for recording a data file having a finite size, comprising:

5 defining a logical cylinder on said storage medium, said cylinder comprising at least one storage ring, and

recording on one of the at least one storage rings said data file,

wherein a length of said logical cylinder is dynamically allocated based on the size of the data file.

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2. The method of claim 1, wherein the length of said logical cylinder is selected so that substantially one half of the data selected from the data file is recorded in a first longitudinal direction of movement of the tape storage medium with respect to a recording head, and the remaining data are recorded in the opposite longitudinal direction of movement of the tape storage medium with respect to the recording head.

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3. The method of claim 2, wherein said the data recorded in the first longitudinal direction comprises data selected from a beginning portion and an end portion of the data file.

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4. The method of claim 1, wherein the logical cylinder comprises a plurality of storage rings and wherein different data files having substantially the same size as the size of the data file which determines the length of the logical cylinder, are stored in different storage rings of the same cylinder.

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5. The method of claim 1, wherein recording includes tracking a servo track disposed on the storage medium and aligning a recording head with said storage ring based on said tracking.

6. The method of claim 1, wherein information about the cylinders and the storage rings is recorded on the storage medium.

7. The method of claim 1, wherein each file is associated with a single ring.

8. A magnetic tape data storage system for storing a data file, comprising:  
a magnetic tape having a longitudinal recording direction and a plurality of transversely spaced logical tracks,  
at least one logical cylinder extending along the longitudinal recording direction, and  
at least one data storage ring located entirely within a respective logical cylinder, said data file recorded in its entirety on a single data storage ring.

9. The magnetic tape data storage system according to claim 8, wherein the longitudinal extent of the logical cylinder is dynamically allocated based on the size of the data file.

10. The magnetic tape data storage system according to claim 8, wherein the ring comprises at least two of the transversely spaced logical tracks and the logical tracks of the ring are recorded in opposite recording directions.

11. The magnetic tape data storage system according to claim 8, wherein the data storage cylinder comprises an identification field and a data storage field.

12. The magnetic tape data storage system according to claim 11, wherein the identification field is recorded on the magnetic recording surface.

13. The magnetic tape data storage system according to claim 8, wherein each data storage ring can store in excess of 256 KBytes.

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14. The magnetic tape data storage system according to claim 8, wherein the magnetic tape that is between one and eight inches wide.

15. The magnetic tape data storage system according to claim 8, wherein the magnetic tape also includes an optically detectable servo track disposed thereon.

16. A method of storing on a storage medium a data file of finite size, comprising:  
determining the size of the data file,  
determining from the size of the data file a length of a storage ring on said storage medium for recording said file on said storage ring, and  
defining on said storage medium a logical cylinder to accommodate said storage ring on said logical cylinder.

17. The method of claim 16, wherein said storage ring comprises two substantially parallel logical tracks, with the logical tracks recorded in opposite recording directions.

18. The method of claim 16, wherein said storage medium comprises logical tracks arranged in a circular pattern and wherein a contiguous portion of said circular pattern defines the storage ring.

19. The method of claim 18, wherein said storage medium is a magnetic disk.

20. The method of claim 18, wherein said storage medium is a cylinder having a magnetic recording surface.

21. A data storage device comprising:  
a recording head assembly having a recording head and a servo head operatively connected to the recording head,  
a recording media capable of being positioned relative to the recording head assembly for recording data in a longitudinal recording direction, and

a control interface receiving data of a file to be recorded on the recording media and positioning information for positioning the recording media relative to the recording head assembly,

wherein said file data are recorded on said recording media in the form of a logical ring located within a logical cylinder spanning a finite length on the recording media, with the data of the entire file stored in a single ring.

22. The data storage device of claim 21, wherein the recording media is a magnetic tape.

23. The data storage device of claim 22, wherein the logical ring is defined by at least two logical tracks disposed within the logical cylinder.

24. The data storage device of claim 23, wherein the logical tracks are recorded in opposite longitudinal recording directions.

25. The data storage device of claim 21, wherein the recording head is positioned in response to position information transmitted by the servo head to the control interface.

SUB A5 26. A method of recording a data file as a logical ring on a recording media, comprising:  
determining a file size of the data file,  
determining a ring size of the logical ring based on said file size,  
defining on said recording media a logical cylinder to contain said logical ring, and  
recording said data file in its entirety within said logical ring.

27. The method of claim 26, wherein an additional data file having substantially the same file size as the file which defines the logical cylinder is recorded in its entirety on an additional logical ring located in the same cylinder.

28. The method of claim 26, wherein the recording media is a magnetic tape and recording further comprises:

5 detecting a last one of previously recorded logical cylinders,  
positioning a head assembly having a recording head in an area of the magnetic tape  
past an end indicator of said last previously recorded logical cylinder, and  
moving at least one of the magnetic tape and the recording head relative to each  
other along to record the data on at least two parallel logical tracks within the logical  
cylinder.

10 29. The method of claim 28, wherein the at least two parallel logical tracks are recorded  
in opposite recording directions.

30. The method of claim 28, wherein the at least two parallel logical tracks are recorded  
in the same recording direction.

5 SUB A6 31. The method of claim 26, wherein the recording media is a magnetic disk and  
defining a logical cylinder includes allocating on the magnetic disk a contiguous circular  
recording track capable of recording said data file as a contiguous logical track.